

## **CONSTANT RETURN OPTIMIZATION TRANSFORMING INDIRECT CALLS TO DATA FETCHES**

### **Abstract of the Invention**

Indirect method invocation of methods that only return constant values is optimized using  
5 fetching operations and return constant tables. Such method calls can be optimized if all possible  
method calls via the call site instruction return a constant value and have no side effects. Each  
constant return value is loaded from a return constant table, and method invocation is eliminated.  
If all possible target methods in a program result in a constant return value and have no side  
effects, an associated virtual function dispatch table (vtable) may be used as the return constant  
10 table. Furthermore, control operation optimization may be applied to identify type constraints,  
based on one or more possible type-dependent constant return values from an indirect method  
invocation. An optimizer identifies and maps between a restricted set of values and an associated  
restricted set of types on which execution code may operate relative to a given control operation.  
The type constraints are used to optimize the associated execution code by filtering propagation  
15 of runtime type approximations for optimization.